bones of the face, and that of the inferior maxilla is specially referred to. This bone is beginning to ossify in a fœtus nine-tenths of an inch long, and is distinctly formed in a fœtus one inch and one-tenth long. Each half may be said to grow from four centres, formed (1) by the cartilage which tips the condyloid extremity, (2) by the layer of membrane in front of Meckel's cartilage, (3) by the ossification of the anterior extremity of Meckel's cartilage, (4) by deposits of bone in the perichondrium of the anterior and middle thirds of the same cartilage, from which is derived the plate of bone which forms the base of the dental canal.

After giving the measurements of the angles formed between the ascending ramus and the body of the bone, and after referring to the subdivisions of the groove for the teeth, the growth of the mylo-hyoidean ridge is described, as well as the ossification of the anterior extremity of Meckel's cartilage, the latter forming a triangular block beneath the incisor sockets, to the twist acquired by which the prominence of the front of the maxilla, known as the mentum or chin, appears to be due. In a fœtus four inches and seven-tenths long, the block of bone formed in the anterior extremity of the cartilage of Meckel is still clearly defined.

VIII. "On a Method of making a Direct Comparison of Electrostatic with Electromagnetic Force; with a Note on the Electromagnetic Theory of Light." By J. Clerk Maxwell, F.R.SS.L. & E. Received June 10, 1868.

(Abstract.)

The experiments described in this paper were made in the laboratory of Mr. Gassiot, who placed his great battery of 2600 cells of bichloride of mercury at the disposal of the author. Mr. Willoughby Smith lent his resistance-coils of 1,102,000 Ohms; Messrs. Forde and Fleeming Jenkin lent a sensitive galvanometer, a set of resistance-coils, a bridge, and a key for double simultaneous contacts; and Mr. C. Hockin undertook the observation of the galvanometer, the adjustment of the resistances, and the testing of the galvanometer, the resistance-coils, and the micrometer-screw. The electrical balance itself was made by Mr. Becker.

The experiments consisted in observing the equilibrium of two forces, one of which was the attraction between two disks, kept at a certain difference of potential, and the other was the repulsion between two circular coils, through which a certain current passed in opposite directions. For this purpose one of the disks, with one of the coils attached to its hinder surface, was suspended on one arm of a torsion-balance, while the other disk, with the other coil behind it, was placed at a certain distance, which was measured by a micrometer-screw. The suspended disk, which was smaller than the fixed disk, was adjusted so that in its position of equilibrium its surface was in the same plane with that of a "guard-ring," as

in Sir W. Thomson's electrometers, and its position was observed by means of a microscope directed on a graduated glass scale attached to the disk. In this way its position could be adjusted to the thousandth of an inch, while a motion of much smaller extent was easily detected.

An exactly similar coil was placed at the other end of the torsion-balance, so as to get rid of the effects of terrestrial magnetism.

It was found that though the suspended disk and coil weighed about half a pound, a very slight want of equality between the opposing forces could be detected, and remedied by means of the micrometer.

The difference of potential between the disks was maintained by means of Mr. Gassiot's great battery. To measure this difference of potential, it was made to produce a current through Mr. Willoughby Smith's resistance-coil, and the primary coil of the galvanometer shunted with a variable resistance.

The current in the coils was maintained by a Grove's battery, and was led through the secondary coil of the galvanometer.

One observer, by means of the micrometer-screw, altered the distance of the disks till the suspended disk was in equilibrium at zero. At the same time the other observer altered the shunt, till the galvanometer-needle was also in equilibrium. The micrometer reading and the resistance of the shunt were then set down as the results of the experiment.

The mean of twelve satisfactory experiments, at distances varying from ·25 to ·5 inch, gave for the ratio of the electromagnetic to the electrostatic unit of electricity—

$$\begin{aligned} v &= 27{\cdot}79 \text{ Ohms, or B. A. units.} \\ &= 277{,}900{,}000 \text{ metres per second.} \\ &= 174{,}800 \text{ statute miles per second.} \end{aligned}$$

This value is considerably lower than that found by MM. Weber and Kohlrausch by a different method, which was 310,740,000 metres per second. Its correctness depends on that of the B. A. unit of resistance, which, however, cannot be very far from the truth, as it agrees so well with Dr. Joule's thermal experiments.

It is also decidedly less than any estimate of the velocity of light, of which the lowest, that of M. Foucault, is 298,000,000 metres per second.

In a note to this paper the author gave his reasons, in as simple a form as he could, for believing that the ratio of the electrical units, and the velocity of light, are one and the same physical quantity, pointing out the difference between his theory and those of MM. Riemann and Lorenz, which appear to lead to the same conclusion.